REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-32 are presently active in this case, Claims 1, 11 and 19 amended by way of the present amendment.

In the outstanding Official Action, Claims 1-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,330,263 to Garbuzov et al. in view of U.S. Patent No. 6,566,688 to Zhang et al.; Claims 11-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,383,211 to Van de Walle et al. in view of U.S. Patent No. 6,046,096 to Ouchi, U.S. Patent No. 6,566,688 to Zhang et al. and U.S. 2002/0075920 to Spruytte et al.

First, Applicants wish to thank Examiner Rodriguez and Supervisory Patent Examiner (SPE) Ip for the February 4, 2004 personal interview at which time the outstanding issues in this case were discussed. During the interview, Applicants presented amendments and arguments substantially as indicated in this response. Agreement was reached in the interview that the independent claims should define the recited composition with the suppression function, which would be reconsidered by the Examiner upon formal filing.

Turning now to the merits, in order to expedite issuance of a patent in this case, Applicants have amended independent Claims 1, 11 and 19 to clarify the patentable distinctions of the present invention over the cited references. Specifically, Applicants have amended independent Claims 1 and 11 to recite that "at least one QW layer comprising $Ga_xIn_{1-x}As_ySb_{1-y}$ to suppress three-dimensional growth of the at least one QW layer." In addition, Applicants have amended independent Claim 19 to recite "an active layer comprising GaAsInNSb, a quantity of Sb selected to reduce three-dimensional growth of the

active layer, and a quantity of In selected to provide longer wavelength operation of the semiconductor laser."

As discussed in the February 4, 2004 personal interview, Applicants invention is directed to a semiconductor laser provided on a GaAs substrate, and which provides improved operating characteristics such as high temperature operation. Prior art devices semiconductor lasers typically use a relatively large amount of Sb to realize long wavelength operation. The present inventors discovered that the quantity of In and/or the quantity of In and N may be selected to provide long wavelength operation of the laser device. However, such use of In, or In and N to provide a long wavelength results in a highly strained quantum well structure which causes three-dimensional (3-D) growth of the quantum well layer. As discussed in the February 4th interview, 3-D growth causes greater defects in the quantum well structure. The present inventors further discovered that a relatively small amount of Sb may be used to suppress this 3-D growth. Thus, Applicants' independent Claims 1 and 11 recite specific ratio ranges for In and Sb in the recited compositions of these claims.

As acknowledged in the outstanding Official Action and the personal interview, none of the cited references disclose the ratio ranges recited in Claims 1 and 11. Nevertheless, the Official Action cites In re Aller and concludes that one of ordinary skill in the art would be motivated to optimize the quantity of In and Sb disclosed in the prior art references in order to arrive at the claimed ranges. However, it is settled law that a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.[1] As discussed in the February 4th interview, Applicants respectfully submit that none of the cited references disclose that varying the amount of Sb would effect 3-D growth of the quantum well layer. That is, the variation in the

[1] In re Antonie, 559 F.2d 618,195 USPQ 6 (CCPA 1977); see also M.P.E.P. § 2143.01.

quantity of Sb has not been taught in the prior art to be a result effective variable that suppresses 3-D growth. As requested by the Examiner, the suppression of 3-D growth has been added to each of independent Claims 1, 11 and 19 to clarify that In re Aller is inapplicable to these claims.

With respect to independent Claim 19, as noted above, this claim has also been amended to recite that a quantity of Indium is selected to provide longer wavelength operation. As discussed in the February 4 interview, none of the cited references show that the amount of indium may be selected to provide longer wavelength operation. This provides an additional basis for patentability of Claim 19 over the cited references.

As Claims 1, 11 and 19, as amended, patentably define over the cited references, Claims 2-6, 12-17 and 20-23, which depend from Claims 1, 11 and 19 respectively, also patentably define over the cited references. Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)

Bradley D. Lytle
Attorney of Record
Registration No. 40,073
Edwin D. Garlepp
Registration No. 45,330

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